

## Screening Plants for Calcium Crystals

Calcium is the fifth most abundant element in the Earth's crust. While its essential roles in human health are quite well known, what it does in plants that it accumulates in is not.

Understanding the mechanisms by which a variety of plants form calcium oxalate crystals might one day lead to making the nutrient more biologically available in foods. It might also lead to a reduction in the risk associated with oxalate, which may contribute to kidney stone formation.

Scientists have begun the first genetic screening system for examining calcium crystal formation in plants. They have been able to observe differences in crystal form, distribution, and amount, as well as in the crystallization process itself.

They will use the screening system to search for genes that determine specific crystal characteristics. Some plants contain no crystals but still seem to grow normally, refuting the idea that the crystals are involved in supporting the plant tissue structure. *Paul Nakata, USDA-ARS Children's Nutrition Research Center at Baylor College of Medicine, Houston, Texas; phone (713) 798-6782, e-mail pnakata@bcm.tmc.edu.*

## Hormone May Herald Health Problems in Livestock

Adrenomedullin (AM) is a naturally occurring amino acid peptide hormone produced in many animal tissues, including heart, lung, and kidney. It is involved in many physiological and pathological processes, and its increase may be associated with some forms of infection in cattle, goats, pigs, and sheep.

For example, tests have shown that blood concentrations of AM increase significantly when animals are exposed to cell wall components—called endotoxins—of disease-causing bacteria. Other tests have demonstrated that calves

harboring internal parasites have more AM in their pancreatic tissue and blood than healthy calves. Both low-level parasite infections of long duration and short bouts of high-level infections can also provoke elevated AM levels. And researchers think it may be possible to use AM levels to detect the presence of other stresses, too, like metabolic diseases.

Development of a rapid test for abnormal AM levels could perhaps enable producers to screen their animals for suspected diseases, parasites, or other stresses. Identifying and treating ailing animals would speed their recovery and make them safe for marketing—a plus for both producer and consumer. *Theodore H. Elsasser, USDA-ARS Growth Biology Laboratory, Beltsville, Maryland; phone (301) 504-8222, e-mail elsasser@lpsi.barc.usda.gov.*

## Cotton Improvements in the Bank

The National Cotton Germplasm Genebank at College Station, Texas, maintains 7,456 accessions of U.S. cotton. Soon, up to 6,000 new accessions will arrive through exchanges with other countries, further swelling an already vast collection. Researchers hope to mine this mother lode of genetic variation to achieve cottons with higher yields, stronger fibers, improved seed quality, and other traits. But to do that, they will need to know which genes govern useful traits and which molecular markers can be used to flag their location.

As this information is discovered, it will be catalogued in genetic libraries that will be available to plant breeders eager to speed cotton yield and quality improvements. It's an international effort that also includes collaborators at Texas A&M.

Nearly 7.5 million bales of U.S. cotton, worth over \$2 billion, were exported in 1999-2000, and upwards of 12 million bales were processed into textiles by U.S. mills. *John Yu, USDA-ARS Crop Germplasm Research Unit,*

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## When's Your Burger Really Done?

It turns out that color alone is not a true test of a grilled burger's doneness. While a brown center sometimes indicates that ground beef is fully cooked, how the meat was handled before cooking can undermine the accuracy of a visual test.

Researchers confirmed this by grilling fresh ground beef, as well as beef frozen



in bulk or as patties. Beef that was frozen in bulk, thawed, formed into patties, and then cooked showed brown color at unsafe temperatures. This premature browning wasn't evident in frozen patties that were thawed and then cooked.

As expected, burgers lost the pink color at their centers as they cooked. But beef patties removed from the grill with pink centers continued to brown for several minutes. So burgers cooked to 135°F and allowed to sit for about 4 minutes looked the same as those cooked to 160°F, the temperature at which *E. coli* bacteria are killed.

Thus, use of a meat thermometer is the only sure way to ensure that grilled meat is fully cooked. *Bradford W. Berry, USDA-ARS Food Technology and Safety Research Unit, Beltsville, Maryland; phone (301) 504-8994, e-mail bberry@lpsi.barc.usda.gov.*